

REMARKS

In accordance with the foregoing, various claims have been amended, and claims 3, 5-10, 18 and 19 have been cancelled. Claims 1, 4, 11-17, 20 and 21 are pending and under consideration.

In the Office Action the Examiner objected to claims 4, 6-10, 14 and 17, while rejecting claims 1, 3, 11-13, 15, 16 and 20-21. The Examiner's rejections and objections are traversed below.

THE PRIOR ART REJECTIONS

In item 5 on pages 2-5 of the Office Action, the Examiner rejected claims 1, 3, 5, 15, 16, 19 and 21 as anticipated by U.S. Patent 5,999,289 to Ihara et al. In item 6 on pages 5-7 of the Office Action, these same claims were also rejected under 35 U.S.C. § 102 as anticipated by JP 2001/320329 to Shigeru. Further, in items 8-9 on pages 7-9 of the Office Action, the Examiner rejected claims 11-13, 18 and 20 as obvious over Ihara et al. in view of U.S. Patent 5,548,435 to Tahara et al. or as obvious over Shigeru in view of Tahara et al.

IHARA ET AL.

U.S. Patent 5,999,289 to Ihara et al. is directed to detection of, and compensation for, a waveform change due to chromatic dispersion. As illustrated in Fig. 1, an optical signal received from an optical transmitter 10 through an optical fiber 12 is converted by a detector 14 into an electrical signal, and equalized and amplified by an equalizing amplifier circuit 16. A waveform change detector 18 detects a waveform change caused by chromatic dispersion, and compensates for the waveform change by controlling either the frequency characteristic of the equalizing amplifier 16 or the amount of chromatic dispersion (wavelength dispersion) of the optical fiber 12 in accordance with the result of the detection. (Col. 5, lines 8-21)

The Ihara et al. technique involves detecting signal powers of the electrical signal at a plurality of frequencies including a frequency substantially sensitive to the effect of the chromatic dispersion of the optical transmission line and a frequency substantially insensitive to the effect of the chromatic dispersion of the optical transmission line. The signal waveform change caused by the chromatic dispersion of the optical transmission line is detected on the basis of the ratio between the signal powers at the plurality of frequencies. Figures 6 and 7 of Ihara et al. disclose circuits for detecting waveform change caused by the dispersion by detecting a low level peak value and a high level peak value by using a peak detector 34, then, by comparing

the mean value with a DC mean value of the waveform detected by a mean value detector 36. Figures 8 and 9 illustrate detecting a waveform change caused by the dispersion by detecting a duty of the waveform.

SHIGERU

The Shigeru Japanese reference is directed to a device and method for detecting pulse distortion of a received optical pulse signal. A voltage comparison circuit 9 compares a voltage circuit output 16 determined by a variable voltage circuit 11 with a filter output 15 of a filter 8. Shigeru can detect whether a pulse distortion is due to pulse compression or pulse expansion so that a voltage monitor 10 monitors the comparison output. Referring to Figure 1, an electrical signal converted by an O/E converter 3 becomes an in-phase electricity waveform 14 which is inputted to a low-pass filter 8. Then, the filter output 15 of the low-pass filter 8 is compared with the voltage circuit output 16 determined by the variable voltage circuit 11. The resulting comparison output is monitored by the voltage monitor 10, to thereby detect whether a pulse distortion results in a pulse compression or a pulse expansion.

TAHARA ET AL.

U.S. Patent 5,548,435 to Tahara et al. is directed to an optical transmitter for optimizing the duty ratio of a high-speed optical transmission signal that has an output unit for providing an optical output signal according to an electrical signal (see Abstract). The Examiner cited Tahara et al. for its teaching of an information extracting section disclosing a feedback controller 6 in Fig. 1 which sets a reference signal depending on a mark ratio of the input optical signal.

CLAIM 1 PATENTABLY DISTINGUISHES OVER THE PRIOR ART

Claim 1 as amended essentially corresponds to prior claim 3 as rewritten in independent form, so that claim 1 as amended recites "wherein said signal transition position detecting section detects the voltage level corresponding to crossing points in an eye pattern of the electrical signal converted in said light receiving section." Prior claim 3 was rejected as anticipated by either Ihara et al. or Shigeru. In particular, on page 4 of the Office Action the Examiner took the position that the features of prior claim 3 were taught by Fig. 5b and the corresponding disclosure of Ihara et al. On page 6 of the Office Action the Examiner took the position that the features of prior claim 3 were taught by Figure 1 and the Abstract of Shigeru.

Applicants submit that Ihara et al. is directed to detection of a waveform change based on the peak detection or the duty detection. Applicants can find nothing in Ihara et al. and particularly the portions identified by the Examiner on page 4 of the Office Action which relate to

detecting the voltage level corresponding to crossing points in an eye pattern of the electrical signal converted in said light receiving section, as set forth in amended claim 1.

Further, Shigeru is directed to detection of the waveform change based on the output of the low-pass filter as described above and does not have any disclosure related to detecting the voltage level corresponding to crossing points in an eye pattern of an electrical signal converted in said light receiving section, as set forth in amended claim 1.

In addition to the above, the Tahara reference is silent on features relating to the crossing points in an eye pattern.

In summary, it is submitted that none of the prior art teaches or suggests the apparatus of amended claim 1 which includes:

wherein said signal transition position detecting section detects the voltage level corresponding to crossing points in an eye pattern of the electrical signal converted in said light receiving section.

Therefore, it is submitted that claim 1 patentably distinguishes over the prior art.

CLAIMS 4, 11-14, 16 AND 17

Claims 4, 11-14, 16 and 17 depend directly or indirectly from claim 1 and include all the features of that claim plus additional features which are not taught or suggested by the prior art. For example, the Examiner has recognized that claims 4 and 14 include patentable subject matter. Therefore, it is submitted that claims 4, 11-14, 16 and 17 patentably distinguish over the prior art.

CLAIM 15 PATENTABLY DISTINGUISHES OVER THE PRIOR ART

Claim 15 is directed to a method of monitoring optical dispersion which includes features:

wherein said selectively detecting comprises detecting a voltage level corresponding to crossing points in an eye pattern of an electrical signal converted in the light receiving sector.

Therefore, it is submitted that claim 15 patentably distinguishes over the prior art.

CLAIM 20 PATENTABLY DISTINGUISHES OVER THE PRIOR ART

Claim 20 is directed to an optical dispersion monitoring apparatus which includes features:

wherein said characteristic amount detecting section detects a voltage level corresponding to crossing points in an eye pattern of an electrical signal corresponding to said input optical signal.

Therefore, it is submitted that claim 20 patentably distinguishes over the prior art.

CLAIM 21 PATENTABLY DISTINGUISHES OVER THE PRIOR ART

Claim 21 is directed to an optical dispersion monitoring apparatus which includes features:

wherein said signal transition position detecting section detects the voltage level corresponding to crossing points in an eye pattern of the electrical signal converted in said light receiving section.

Therefore, it is submitted that claim 21 patentably distinguishes over the prior art.

SUMMARY

It is submitted that none of the references, either taken alone or in combination, teaches the present claimed invention. Thus, claims 1, 4, 11-17, 20 and 21 are deemed to be in a condition suitable for allowance. Reconsideration of the claims and an early notice of allowance are earnestly solicited.

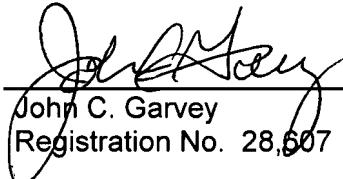
Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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